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FILE 'BIOSIS, CAPLUS, EMBASE, MEDLINE, JAPIO' ENTERED AT 17:01:36 ON 09 FEB 2007

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L1         16100 S MICROFLUID?
L2           892 S L1 AND VELOCI?
L3           310 S L2 AND TIME?
L4             1 S L2 AND PLURALI?
L5             8 S L3 AND PD<2000
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ANSWER 3 OF 8 CAPLUS COPYRIGHT 2007 ACS on STN
AN 1999:438989 CAPLUS
DN 131:85047
ED Entered STN: 16 Jul 1999
TI Whole blood diagnostics in standard gravity and microgravity by use of microfluidic structures (T-sensors)
AU Weigl, Bernhard H.; Kriebel, Jennah; Mayes, Kelly J.; Bui, Todd; Yager, Paul
CS Department Bioengineering, Univ. Washington, Seattle, WA, 98195, USA
SO Mikrochimica Acta (1999), 131(1-2), 75-83
CODEN: MIACAQ; ISSN: 0026-3672
PB Springer-Verlag Wien
DT Journal
LA English
CC 9-5 (Biochemical Methods)
AB In channels with dimensions much less than 1 mm, fluids with viscosities similar to or higher than that of water and flowing at low velocities exhibit laminar behavior. This allows the adjacent flow of fluids and particles in a channel without mixing other than by diffusion. The authors demonstrate the use of a 3-input microfluidic device known as a T-Sensor for the anal. of blood. A sample solution (e.g. whole blood), a receptor solution (e.g. an indicator solution), and a reference solution (a known analyte standard) are introduced into a common channel (T-Sensor), and How side by side until they leave the structure. Smaller particles such as ions or small proteins diffuse rapidly across the quid boundaries, whereas larger mols. diffuse more slowly. Large particles (e.g. blood cells) show no significant diffusion within the time the flow streams are in contact. 2 Interface zones are formed between the fluid layers. The ratio of a property (e.g. fluorescence intensity) of the outer portions of the 2 interface zones is a function of the concentration of the analyte, and is largely free of cross-sensitivities to other sample components and instrument parameters. This device allows, for example, one-time or continuous monitoring of the concentration of analytes in microliters of whole blood without the use of membranes or prior removal of blood cells. The principle is illustrated by the determination of pH and human albumin in whole blood and serum.
Results are also presented for 0-gravity expts. performed with a T-Sensor on board a NASA exptl. plane. Due to its microfluidic flow characteristics, a T-Sensor functions independently of orientation and strength of the gravitational field. This was demonstrated by exposing a T-Sensor to variations in gravity from 0-1.8 g in a NASA KC135A plane flying repetitive parabolic flight curves.
ST blood analysis pH gravity microgravity microfluidity T sensor; biosensor blood analysis pH microfluidity gravity microgravity; microanalysis blood pH gravity microgravity microfluidity
IT Microanalysis
Space travel
Viscosity
pH
(laminar flow of whole blood in standard gravity and microgravity studied by microfluidic structures)
IT Flow
(laminar; Laminar flow of whole blood in standard gravity and microgravity studied by microfluidic structures (T-sensors))
IT Fluidization
(microfluidization; whole blood diagnostics in standard gravity and microgravity by microfluidic structures (T-sensors))
IT Biosensors
Blood analysis
Gravity
Microgravity

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Space travel
Viscosity
pH
(laminar flow of whole blood in standard gravity and microgravity studied by microfluidic structures)
IT Flow
(laminar; Laminar flow of whole blood in standard gravity and microgravity studied by microfluidic structures (T-sensors))
IT Fluidization
(microfluidization; whole blood diagnostics in standard gravity and microgravity by microfluidic structures (T-sensors))
IT Biosensors
Blood analysis
Gravity
Microgravity

(whole blood diagnostics in standard gravity and microgravity by microfluidic structures (T-sensors))

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD

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(whole blood diagnostics in standard gravity and microgravity by microfluidic structures (T-sensors))

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ANSWER 1 OF 8 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN
AN 1997:341070 BIOSIS
DN PREV199799640273
TI A novel instrument for studying the flow behaviour of erythrocytes through microchannels simulating human blood capillaries.
AU Sutton, N. [Reprint author]; Tracey, M. C.; Johnston, I. D.; Greenaway, R. S.; Rampling, M. W. [Reprint author]
CS Dep. Physiol. Biophys., Imperial Coll. Sch. Med., St. Mary's, London W2 1PG, UK
SO Microvascular Research, (1997) Vol. 53, No. 3, pp. 272-281.
CODEN: MIVRA6. ISSN: 0026-2862.
DT Article
LA English
ED Entered STN: 11 Aug 1997
Last Updated on STN: 11 Aug 1997
AB A novel instrument has been developed to study the microrheology of erythrocytes as they flow through channels of dimensions similar to human blood capillaries. The channels are produced in silicon substrates using microengineering technology. Accurately defined, physiological driving pressures and temperatures are employed whilst precise, real-time image processing allows individual cells to be monitored continuously during their transit. The instrument characterises each cell in a sample of ca. 1000 in terms of its volume and flow velocity profile during its transit through a channel. The unique representation of the data in volume/velocity space provides new insights into the microrheological behaviour of blood. The image processing and subsequent data analysis enable the system to reject anomalous events such as multiple cell transits, thereby ensuring integrity of the resulting data. By employing an array of microfluidic flow channels we can integrate a number of different but precise and highly reproducible channel sizes and geometries within one array, thereby allowing multiple, concurrent, isobaric measurements on one sample. As an illustration of the performance of the system, volume/velocity data sets recorded in a microfluidic device incorporating multiple channels of 100 mu-m length and individual widths ranging between 3.0 and 4.0 mu-m are presented.
CC Cytology - Human 02508
Biophysics - Methods and techniques 10504
Movement 12100
Cardiovascular system - General and methods 14501
Cardiovascular system - Physiology and biochemistry 14504
Blood - General and methods 15001
Blood - Blood and lymph studies 15002
Blood - Blood cell studies 15004
IT Major Concepts
Blood and Lymphatics (Transport and Circulation); Cardiovascular System (Transport and Circulation); Cell Biology; Methods and Techniques
IT Miscellaneous Descriptors
ANALYTICAL METHOD; BLOOD; BLOOD AND LYMPHATICS; BLOOD CAPILLARIES; CARDIOVASCULAR SYSTEM; CIRCULATORY SYSTEM; EQUIPMENT; ERYTHROCYTE FLOW BEHAVIOR; ERYTHROCYTE FLOW VELOCITY PROFILE; ERYTHROCYTE VOLUME; ERYTHROCYTES; IMAGING METHOD; METHODOLOGY; MICROCHANNELS; MICROENGINEERING TECHNOLOGY; MICROFLUIDIC DEVICE; MICRORHEOLOGY; NOVEL INSTRUMENT; PRECISION; REAL-TIME IMAGE PROCESSING
ORGN Classifier
Hominidae 86215
Super Taxa
Primates; Mammalia; Vertebrata; Chordata; Animalia
Organism Name
human
Taxa Notes
Animals, Chordates, Humans, Mammals, Primates, Vertebrates

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ANALYTICAL METHOD; BLOOD; BLOOD AND LYMPHATICS; BLOOD CAPILLARIES; CARDIOVASCULAR SYSTEM; CIRCULATORY SYSTEM; EQUIPMENT; ERYTHROCYTE FLOW BEHAVIOR; ERYTHROCYTE FLOW VELOCITY PROFILE; ERYTHROCYTE VOLUME; ERYTHROCYTES; IMAGING METHOD; METHODOLOGY; MICROCHANNELS; MICROENGINEERING TECHNOLOGY; MICROFLUIDIC DEVICE; MICRORHEOLOGY; NOVEL INSTRUMENT; PRECISION; REAL-TIME IMAGE PROCESSING
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Taxa Notes
Animals, Chordates, Humans, Mammals, Primates, Vertebrates

ANSWER 4 OF 8 CAPLUS COPYRIGHT 2007 ACS on STN
AN 1999:61773 CAPLUS
DN 130:264301
ED Entered STN: 01 Feb 1999
TI Cell Separation on Microfabricated Electrodes Using Dielectrophoretic/Gravitational Field-Flow Fractionation
AU Yang, Jun; Huang, Ying; Wang, Xiao-Bo; Becker, Frederick F.; Gascoyne, Peter R. C.
CS Department of Molecular Pathology, The University of Texas M. D. Anderson Cancer Center, Houston, TX, 77030, USA
SO Analytical Chemistry (1999), 71(5), 911-918
CODEN: ANCHAM; ISSN: 0003-2700
PB American Chemical Society
DT Journal
LA English
CC 9-7 (Biochemical Methods)
Section cross-reference(s): 6, 13, 76
AB Dielectrophoretic/gravitational field-flow fractionation (DEP/G-FFF) was used to sep. cultured human breast cancer MDA-435 cells from normal blood cells mixed together in a sucrose/dextrose medium. An array of microfabricated, interdigitated electrodes of 50 μm widths and spacings, and lining the bottom surface of a thin chamber (0.42 mm H . times. 25 mm W .times. 300 mm L), was used to generate DEP forces that levitated the cells. A 10-μL cell mixture sample containing .apprx.50,000 cells was introduced into the chamber, and cancerous and normal blood cells were levitated to different heights according to the balance of DEP and gravitational forces. The cells at different heights were transported at different velocities under the influence of a parabolic flow profile that was established in the chamber and were thereby separated Separation performance depended on the frequency and voltage of the applied DEP field and the fluid-flow rate. It took as little as 5 min to achieve cell separation An anal. of the DEP/G-FFF results revealed that the separation exploited the difference in dielec. and d. properties between cell populations. The DEP/G-FFF technique is potentially applicable to many biol. and biomedical problems, especially those related to microfluidic systems.
ST dielectrophoretic gravitational field flow fractionation cell sepn
IT Animal cell line
(MDA-435; cell separation on microfabricated electrodes using dielectrophoretic-gravitational field-flow fractionation)
IT Animal cell
Erythrocyte
(cell separation on microfabricated electrodes using dielectrophoretic-gravitational field-flow fractionation)
IT Electrophoresis apparatus
Separation
(dielectrophoretic/gravitational field-flow fractionation; cell separation on microfabricated electrodes using dielectrophoretic-gravitational field-flow fractionation)
IT Dielectrophoresis
(gravitational field-flow fractionation; cell separation on microfabricated electrodes using dielectrophoretic-gravitational field-flow fractionation)
RE.CNT 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD
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ST dielectrophoretic gravitational field flow fractionation cell sepn
IT Animal cell line
(MDA-435; cell separation on microfabricated electrodes using dielectrophoretic-gravitational field-flow fractionation)
IT Animal cell
Erythrocyte
(cell separation on microfabricated electrodes using dielectrophoretic-gravitational field-flow fractionation)
IT Electrophoresis apparatus
Separation
(dielectrophoretic/gravitational field-flow fractionation; cell separation on microfabricated electrodes using dielectrophoretic-gravitational field-flow fractionation)
IT Dielectrophoresis
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ANSWER 5 OF 8 CAPLUS COPYRIGHT 2007 ACS on STN
AN 1998:676061 CAPLUS
DN 129:332732
ED Entered STN: 27 Oct 1998
TI A particle image velocimetry system for microfluidics
AU Santiago, J. G.; Wereley, S. T.; Meinhart, C. D.; Beebe, D. J.; Adrian, R. J.
CS Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, 61801, USA
SO Experiments in Fluids (1998), 25(4), 316-319
CODEN: EXFLDU; ISSN: 0723-4864
PB Springer-Verlag
DT Journal
LA English
CC 48-7 (Unit Operations and Processes)
Section cross-reference(s): 73
AB A micron-resolution particle image velocimetry (micro-PIV) system has been developed to measure instantaneous and ensemble-averaged flow fields in micron-scale fluidic devices. The system utilizes an epifluorescent microscope, 100-300 nm diameter seed particles, and an intensified CCD camera to record high-resolution particle-image fields. Velocity vector fields can be measured with spatial resolns. down to 6.9 .times. 6.9 .times. 1.5 μm. The vector fields are analyzed using a double-frame cross-correlation algorithm. In this technique, the spatial resolution and the accuracy of the velocity measurements is limited by the diffraction limit of the recording optics, noise in the particle image field, and the interaction of the fluid with the finite-sized seed particles. The stochastic influence of Brownian motion plays a significant role in the accuracy of instantaneous velocity measurements. The micro-PIV technique is applied to measure velocities in a Hele-Shaw flow around a 30 μm (major diameter) elliptical cylinder, with a bulk velocity of approx. 50 μm/s.
ST particle image velocimetry microfluidics
IT Flow
(Hele-Shaw; particle image velocimetry system for microfluidics)
IT Microscopes
(epifluorescent; particle image velocimetry system for microfluidics)
IT Imaging
(fluorescent; particle image velocimetry system for microfluidics)
IT Micromachines
(microelectromech. systems; particle image velocimetry system for microfluidics)
IT Brownian motion
Fluid dynamics
Velocity
(particle image velocimetry system for microfluidics)
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Adrian, R; Ann Rev Fluid Mech 1991, V23, P261
(2) Batchelor, G; An introduction to fluid dynamics 1987
(3) Born, M; Principles of Optics 1991
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ANSWER 5 OF 8 CAPLUS COPYRIGHT 2007 ACS on STN
AN 1998:676061 CAPLUS
DN 129:332732
ED Entered STN: 27 Oct 1998
TI A particle image velocimetry system for microfluidics
AU Santiago, J. G.; Wereley, S. T.; Meinhart, C. D.; Beebe, D. J.; Adrian, R. J.
CS Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, 61801, USA
SO Experiments in Fluids (1998), 25(4), 316-319
CODEN: EXFLDU; ISSN: 0723-4864
PB Springer-Verlag
DT Journal
LA English
CC 48-7 (Unit Operations and Processes)
Section cross-reference(s): 73
AB A micron-resolution particle image velocimetry (micro-PIV) system has been developed to measure instantaneous and ensemble-averaged flow fields in micron-scale fluidic devices. The system utilizes an epifluorescent microscope, 100-300 nm diameter seed particles, and an intensified CCD camera to record high-resolution particle-image fields. Velocity vector fields can be measured with spatial resolns. down to 6.9 .times. 6.9 .times. 1.5 μm. The vector fields are analyzed using a double-frame cross-correlation algorithm. In this technique, the spatial resolution and the accuracy of the velocity measurements is limited by the diffraction limit of the recording optics, noise in the particle image field, and the interaction of the fluid with the finite-sized seed particles. The stochastic influence of Brownian motion plays a significant role in the accuracy of instantaneous velocity measurements. The micro-PIV technique is applied to measure velocities in a Hele-Shaw flow around a 30 μm (major diameter) elliptical cylinder, with a bulk velocity of approx. 50 μm/s.
ST particle image velocimetry microfluidics
IT Flow
(Hele-Shaw; particle image velocimetry system for microfluidics)
IT Microscopes
(epifluorescent; particle image velocimetry system for microfluidics)
IT Imaging
(fluorescent; particle image velocimetry system for microfluidics)
IT Micromachines
(microelectromech. systems; particle image velocimetry system for microfluidics)
IT Brownian motion
Fluid dynamics
Velocity
(particle image velocimetry system for microfluidics)
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(7) Gravesen, P; J Micromech Microeng 1993, P3
(8) Keane, R; Meas Sci Tech 1995, V6, P754 CAPLUS
(9) Lanzillotto, A; AIAA Paper 97-1790, 28th Fluid Dynamics Conf 1997
(10) Prasad, A; Exp Fluids 1992, V13, P105 CAPLUS

ANSWER 6 OF 8 CAPLUS COPYRIGHT 2007 ACS on STN
AN 1997:186940 CAPLUS
DN 126:209094
ED Entered STN: 21 Mar 1997
TI Transport, Manipulation, and Reaction of Biological Cells On-Chip Using Electrokinetic Effects
AU Li, P. C. H.; Harrison, D. J.
CS Department of Chemistry, University of Alberta, Edmonton, AB, T6G 2G2, Can.
SO Analytical Chemistry (1997), 69(8), 1564-1568
CODEN: ANCHAM; ISSN: 0003-2700
PB American Chemical Society
DT Journal
LA English
CC 9-1 (Biochemical Methods)
Section cross-reference(s): 16
AB A microfluidic system was fabricated on a glass chip to study mobilization of biol. cells on-chip. Electroosmotic and/or electrophoretic pumping were used to drive the cell transport within a network of capillary channels. Whole cells such as Saccharomyces cerevisiae, canine erythrocyte, and Escherichia coli were employed in this work. Photographs are presented to illustrate how cells are selected and transported from one location to another within the capillary network, with velocities up to about 0.5 mm/s in capillaries with a 15- . times. 55-μm cross-section. The mixing of canine erythrocytes with the lysing agent SDS at an intersection within the chip was performed to demonstrate that cell selection and subsequent reaction can be accomplished within the microchip.
ST cell transport manipulation reaction microfluidic system; glass chip microfluidic system cell reaction; SDS lysis cell microfluidic system
IT Capillary tubes
Cell
Electrokinetic phenomena
Electroosmosis
Electrophoresis
Erythrocyte
Escherichia coli
Saccharomyces cerevisiae
(transport and manipulation and reaction of biol. cells on-chip using electrokinetic effects)
IT Glass, uses
RL: NUU (Other use, unclassified); USES (Uses)
(transport and manipulation and reaction of biol. cells on-chip using electrokinetic effects)
IT 151-21-3, SDS, uses
RL: NUU (Other use, unclassified); USES (Uses)
(transport and manipulation and reaction of biol. cells on-chip using electrokinetic effects)
RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Agar, N; Red Blood Cells of Domestic Mammals 1983
(2) Berry, D; The Biology of Yeast 1982
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(5) Effenhauser, C; Anal Chem 1993, V65, P2637 CAPLUS
(6) Ewing, A; Anal Chem 1994, V66, P527A CAPLUS
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(10) Harrison, D; Science 1993, V261, P895 CAPLUS
(11) Harrison, D; Technical Digest, Transducers 95, 8th International Conference on Solid-State Sensors and Actuators 1995, P752
(12) Jacobson, S; Anal Chem 1994, V66, P2369 CAPLUS

ANSWER 6 OF 8 CAPLUS COPYRIGHT 2007 ACS on STN
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Section cross-reference(s): 16
AB A microfluidic system was fabricated on a glass chip to study mobilization of biol. cells on-chip. Electroosmotic and/or electrophoretic pumping were used to drive the cell transport within a network of capillary channels. Whole cells such as Saccharomyces cerevisiae, canine erythrocyte, and Escherichia coli were employed in this work. Photographs are presented to illustrate how cells are selected and transported from one location to another within the capillary network, with velocities up to about 0.5 mm/s in capillaries with a 15- . times. 55-μm cross-section. The mixing of canine erythrocytes with the lysing agent SDS at an intersection within the chip was performed to demonstrate that cell selection and subsequent reaction can be accomplished within the microchip.
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IT Capillary tubes
Cell
Electrokinetic phenomena
Electroosmosis
Electrophoresis
Erythrocyte
Escherichia coli
Saccharomyces cerevisiae
(transport and manipulation and reaction of biol. cells on-chip using electrokinetic effects)
IT Glass, uses
RL: NUU (Other use, unclassified); USES (Uses)
(transport and manipulation and reaction of biol. cells on-chip using electrokinetic effects)
IT 151-21-3, SDS, uses
RL: NUU (Other use, unclassified); USES (Uses)
(transport and manipulation and reaction of biol. cells on-chip using electrokinetic effects)
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(13) Jacobson, S; Anal Chem 1994, V66, P3472 CAPLUS
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(30) Zhu, A; J Chromatogr A 1989, V470, P251 MEDLINE
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     FEB 2007
L1        16100 S MICROFLUID?
L2          892 S L1 AND VELOCI?
L3          310 S L2 AND TIME?
L4            1 S L2 AND PLURALI?
L5            8 S L3 AND PD<2000

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